

REMARKS

This response addresses the issues raised by the Examiner in the Office Action mailed March 3, 2004. Initially, Applicants would like to thank the Examiner for the careful consideration given in this case. The Claims are 1-8. Claim 1 has been currently amended. Thus, Claims 1-8 are pending in this case all to more clearly and distinctly claim Applicants' invention. In view of the above amendments and the following remarks, Applicants submit that the presently pending claims are in condition for allowance and notification of such is respectfully requested.

Claim 1 has been currently amended to add a method for detecting a ratio of content of complementary nucleic acid fragment contained in plural samples includes the step of comparing the electric current detected in the former detecting procedure and the electric current detected in the latter detecting procedure, whereby detecting the ratio of content of complementary nucleic acid fragments between the plural samples. Support for currently amended Claim 1 appears, for example, in the specification at page 6, lines 13-18. No new matter has been added.

Rejection Based on Bamdad Under 35 U.S.C. § 102 (e)

The Examiner rejects Claims 1-8 under 35 U.S.C. § 102 (e) as being anticipated by U.S. Patent 6,541,617 to Bamdad et al as applied to currently amended Claim 1. Applicants respectfully traverse this rejection.

To establish obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art MPEP §2143.03. Applicants respectfully submit that the Examiner is unclear on how she compares the steps involved in the present invention with Bamdad.

Bamdad discloses the use of particles comprising binding ligands and electron transfer moieties. See Abstract. Bamdad discloses that upon binding of a target analyte, a particle and reporter composition are associated and transported to an electrode surface. Then the electron transfer moieties are then detected, allowing the presence or absence of the target

analyte to be determined. While Bamdad teaches that once assay complexes are formed, the presence or absence of the electron transfer moieties are detected using the electrode is well known in the art. However, Bamdad does not teach the step of attaching an electroconductive label to nucleic acid fragments in one sample and attaching another electroconductive label to nucleic acid fragments in another sample where both electroconductive labels have differing oxidation reduction potentials. Bamdad also does not teach then preparing a mixture of the samples containing nucleic acid fragment to which electroconductive labels are attached. Bamdad does not teach that once the mixture is brought into contact with an electroconductive microarray having plural electrodes an electric potential is applied to the electrodes corresponding to the oxidation-reduction potential of the two electroconductive labels and the electric current flowing along the hybrid structure is detected on the electrode. Lastly, Bamdad does not teach comparing the electric current detected in the former detecting procedure and the electric current detected in the latter detecting procedure, where detecting the ratio of content of the complementary nucleic acid fragments between plural samples.

The present invention claims a method for detecting a ratio of content of complementary nucleic acid fragments contained in plural samples, utilizing a combination of an electroconductive microarray having plural electrodes onto which probe molecule complementary to the nucleic acid fragments are fixed and plural electroconductive labels. More specifically, the method of the present invention claims the following steps: (1) attaching an electroconductive label to nucleic acid fragments in one sample and attaching another electroconductive label to nucleic acid fragments in another sample, the former electroconductive label and the latter electroconductive label having oxidation-reduction potentials differing from each other; (2) preparing a mixture of the samples containing nucleic acid fragments to which electroconductive labels are attached; (3) bringing the mixture into contact with an electroconductive microarray having plural electrodes onto which probe molecules complementary to the nucleic acid fragments are fixed, so that hybridization between the nucleic acid fragments having electroconductive labels and the probe molecules on the electroconductive microarray can proceed to form hybrid structures on the electrodes;

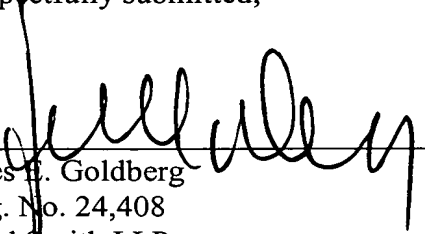
(4) applying to the electrode an electric potential corresponding to the oxidation-reduction potential of the former electroconductive label and detecting on the electrode an electric current flowing along the hybrid structure; (5) applying to the electrode an electric potential corresponding to the oxidation-reduction potential of the latter electroconductive label and detecting on the electrode an electric current flowing along the hybrid structure; and (6) comparing the electric current detected in the former detecting procedure and the electric current detected in the latter detecting procedure, whereby detecting the ratio of content of the complementary nucleic acid fragments between plural samples. The combination of steps (1) to (6) of the present invention enables a user to detect the ratio of content of complementary nucleic acid fragments in plural samples.

Bamdad does not disclose the method of detecting a ratio of content of complementary nucleic acid fragments contained in plural samples by the combination of step (1) through to step (6) of the present invention. Since Bamdad does not disclose this feature of the present invention, Bamdad does not disclose each and every element of the claimed invention. Accordingly, Applicants respectfully request that the rejection under U.S.C. § 102(e) be reconsidered and withdrawn.

In view of the remarks presented herein, it is respectfully submitted that the present application is in condition for final allowance and notice to such effect is requested. If the Examiner believes that additional issues need to be resolved before this application can be passed to issue, the undersigned invites the Examiner to contact him at the telephone number provided below.

Respectfully submitted,

JEG:
September 3, 2004
Tel. (212) 521-5400



Jules B. Goldberg
Reg. No. 24,408
Reed Smith LLP
599 Lexington Avenue
New York, NY 10022